In the Claims, please substitute claims that are amended on the following pages for similarly numbered claims in the pending application. Changes to claims are shown with added text underlined and a strikethrough indicating canceled text. Original claims are indicated as "Original", claims previously amended are indicated as "Previously Presented", claims cancelled previously or by this amendment are indicated as "Cancelled", claims withdrawn previously or by this amendment are indicated as "Withdrawn", new claims are indicated as "New" and claims amended by this amendment are indicated as "Currently Amended".

1. (Original) A method for reducing event loss in a digital time stamped PET scanner including a master clock that has a master clock cycle and an event processing circuit that divides each clock cycle into a plurality of time stamps, the scanner also including coincidence detection circuitry that compares time stamps within each clock cycle to identify coincidence event pairs, the method comprising the steps of:

a. for consecutive leading and following clock cycles where each of the leading and following cycles are master cycles, identifying an overlap period that includes a portion of a first of the master cycles adjacent a second of the master cycles;

b. adding the overlap period to the second of the master cycles to generate an extended cycle;

c. identifying overlap events that occur during the overlap period in the first of the master cycles;

d. copying the overlap events to the overlap period in the extended cycle; and

e. comparing events in the extended cycle to identify coincidence event pairs.

2. (Original) The method of claim 1 wherein the scanner is used to collect events during a plurality of consecutive clock cycles and wherein the method further includes the step of repeating steps (a) through (e) for each two consecutive clock cycles.

3. (Original) The method of claim 1 further including the step of counting event pairs and wherein the step of comparing includes, for each coincidence event pair, determining if both events in the pair occur during the overlap period and, where both events occur during the overlap period, skipping the step of counting the event pair.

4. (Original) The method of claim 1 wherein the leading cycle and following cycle are the first and second cycles, respectively, so that the step of identifying an overlap period includes the step of identifying the ending portion of the leading cycle adjacent the following cycle.

5.   (Original)   The method of claim 1 wherein the leading cycle and following cycle are the second and first cycles, respectively, so that the step of identifying an overlap period includes the step of identifying the beginning portion of the following cycle adjacent the leading cycle.

6.   (Original)   The method of claim 1 wherein the scanner is characterized by a coincidence window and the overlap period has a duration at least as long as one half the coincidence window.

7.   (Original)   An apparatus for reducing event loss in a digital time stamped PET scanner including a master clock that has a master clock cycle and an event processing circuit that divides each clock cycle into a plurality of time stamps, the scanner also including coincidence detection circuitry that compares time stamps within each clock cycle to identify coincidence event pairs, the apparatus comprising:

an extender that for consecutive leading and following clock cycles where each of the leading and following cycles are master cycles, identifies an overlap period that includes a portion of a first of the master cycles adjacent a second of the master cycles and adds the overlap period to the second of the master cycles to generate an extended cycle;

a duplicator for identifying overlap events that occur during the overlap period in the first of the master cycles and copying the overlap events to the overlap period in the extended cycle;

a comparator for comparing events in the extended cycle to identify coincidence event pairs; and

a sorter for counting the event pairs.

8.   (Original)   The apparatus of claim 7 wherein the scanner is used to collect events during a plurality of consecutive clock cycles and wherein the apparatus repeats the extending, copying, comparing and counting process for each two consecutive clock cycles.

9.   (Original)   The apparatus of claim 7 further including a duplicate eliminator wherein that, for each coincidence event pair, determines if both events in the pair occur during the overlap period and, where both events occur during the overlap period, causes the sorter to skip counting the event pair.

10.   (Original)   The apparatus of claim 7 wherein the leading cycle and following cycle are the first and second cycles, respectively, so that the extender identifies an overlap period by identifying the ending portion of the leading cycle adjacent the following cycle.

11.   (Original)   The apparatus of claim 7 wherein the leading cycle and following cycle are the second and first cycles, respectively, so that the extender identifies an overlap period by identifying the beginning portion of the following cycle adjacent the leading cycle.

12.   (Original)   The apparatus of claim 7 wherein the scanner is characterized by a coincidence window and the overlap period has a duration at least as long as one half the coincidence window.

13. (Original) A method for reducing event loss in a digital time stamped PET scanner including a master clock that has a master clock cycle and an event processing circuit that divides each clock cycle into a plurality of time stamps, the scanner also including coincidence detection circuitry that compares time stamps within each clock cycle to identify coincidence event pairs, the method comprising the steps of:

a. for consecutive leading and following clock cycles where each of the leading and following cycles are master cycles, identifying an overlap period that includes a portion of a first of the master cycles adjacent a second of the master cycles;

b. adding the overlap period to the second of the master cycles to generate an extended cycle;

c. identifying overlap events that occur during the overlap period in the first of the master cycles;

d. copying the overlap events to the overlap period in the extended cycle;

e. comparing events in the extended cycle to identify coincidence event pairs;

f. for each coincidence event pair, determining if both events in the pair occur during the overlap period and, where both events occur during the overlap period, skipping to step (h);

g. counting the event pairs; and

h. repeating steps (a) through (g) with the following cycle as a new leading cycle and the cycle after the following cycle as a new following cycle.

14. (Original) The method of claim 13 wherein the leading cycle and following cycle are the first and second cycles, respectively, so that the step of identifying an overlap period includes the step of identifying the ending portion of the leading cycle adjacent the following cycle.

15. (Original) The method of claim 13 wherein the leading cycle and following cycle are the second and first cycles, respectively, so that the step of identifying an overlap period includes the step of identifying the beginning portion of the following cycle adjacent the leading cycle.

16.   (Original)   The method of claim 15 wherein the scanner is characterized by a coincidence window and the overlap period has a duration at least as long as one half the coincidence window.

17.   (Currently Amended)   An apparatus for reducing event loss in a digital time stamped PET scanner including a master clock that has a master clock cycle and an event processing circuit that divides each clock cycle into a plurality of time stamps, the scanner also including coincidence detection circuitry that compares time stamps within each clock cycle to identify coincidence event pairs, the apparatus comprising:

a.   for consecutive leading and following clock cycles where each of the leading and following cycles are master cycles, means for identifying an overlap period that includes a portion of a first of the master cycles adjacent a second of the master cycles;

b.   means for adding the overlap period to the second of the master cycles to generate an extended cycle;

c.   means for identifying overlap events that occur during the overlap period in the first of the master cycles;

d.   means for copying the overlap events to the overlap period in the extended cycle;

e.   means for comparing events in the extended cycle to identify coincidence event pairs; and

f.   means for counting the event pairs.

18.   (Original)   The apparatus of claim 17 wherein the means for comparing includes, for each coincidence event pair, means for determining if both events in the pair occur during the overlap period and, where both events occur during the overlap period, means for skipping the step of counting the event pair.

19.   (Original)   The apparatus of claim 17 wherein the leading cycle and following cycle are the first and second cycles, respectively, so that the means for identifying an overlap period includes a means for identifying the ending portion of the leading cycle adjacent the following cycle.

20.   (Currently Amended)   The method of claim 17 wherein the leading cycle and following cycle are the second and first cycles, respectively, so that the means for identifying an overlap period includes a means for identifying the beginning portion of the following cycle adjacent the leading cycle.